

R E M A R K S

Reconsideration of this application, as amended, is respectfully requested.

THE CLAIMS

Claim 11 has been amended to clarify the feature of the present invention whereby the probes, to which the samples are coupled, are fixed directly on the surface of the waveguide plate, as shown in detail in Fig. 4 and as supported by the disclosure in the specification at, for example, page 4, lines 19-24.

In addition, claim 11 has been amended to clarify the feature of the present invention whereby the fluorescent substance labeled on the samples coupled to the probes is excited by an evanescent wave generated when the waveguide plate waveguides the fluorescent excitation light from the light source into an interior of the waveguide plate, and entirely reflects the fluorescent excitation light, as supported by the disclosure in the specification at, for example, page 6, lines 5-18.

No new matter has been added, and it is respectfully requested that the amendments to claim 11 be approved and entered.

THE PRIOR ART REJECTION

Claims 11-13 stand finally rejected under 35 USC 102 as being anticipated by King et al. This rejection, however is again respectfully traversed.

As recognized by the Examiner, King et al discloses an apparatus whereby samples are analyzed by detecting fluorescence while using an evanescent wave to excite a fluorescent substance labeled on samples coupled to probes. However, it is respectfully submitted that King et al does not disclose, teach or suggest the feature of the present invention as recited in amended independent claim 11 whereby the substrate surface on which the sampling probes are fixed is the waveguide plate.

According to the present invention as recited in amended independent claim 11, a sample chip analyzing device is provided which comprises, in particular, a waveguide plate which entirely reflects and wave-guides incident light, and which includes a surface on which a number of sampling probes are fixed. That is, according to the present invention as recited in amended claim 11, the waveguide plate is a (glass) substrate having the samples directly fixed on the surface thereof.

By contrast, King et al discloses a prism 104 with a substrate 102 mounted thereon, and an index matching film 108, such as a compressible optical polymer, provided between the prism 104 and the substrate 102. In King et al, an array 110

of molecular tags is provided on the surface 112 of the substrate 102. (See Fig. 1 and the corresponding description at column 5, lines 5-18 of King et al.) Thus, it is respectfully submitted that Fig. 1 of King et al clearly does not disclose, teach or suggest the feature of the claimed present invention whereby the substrate surface on which the sampling probes are fixed is the waveguide plate.

In addition, it is respectfully submitted that the alternative embodiments of King et al also do not disclose, teach or suggest this feature of the claimed present invention. For example, Fig. 6 of King et al shows an alternative embodiment in which a fiber laser 444 is provided as the light source for wave-guiding light, and a portion of cladding 448 is removed to expose a total internal reflection (TIR) surface 446. In this case also, however, the sampling probes are not fixed to a surface of the wave-guiding element. In fact, a separate array 430 having samples thereon is mounted adjacent to the TIR surface 446.

Still further, according to the apparatuses shown in Figs. 4 and 5 of King et al, a separate array 430 must be provided adjacent to the TIR surface 426 of the reflective element 424.

Thus, it is again respectfully submitted that King et al clearly does not at all disclose, teach or suggest the feature of the claimed present invention whereby the substrate surface on which the sampling probes are fixed is the waveguide plate.

On page 2 of the Advisory Action, the Examiner points out that a "low output light source" is not a claimed feature of the present invention. It is respectfully pointed out, however, that the use of a low output light source is merely an advantageous effect of the claimed structural features of the present invention which are recited in the claims.

As pointed out in the Amendment under 37 CFR 1.116 filed February 18, 2004, it is noted that when using the apparatus disclosed by King et al, the evanescent wave irradiated onto the samples greatly attenuates when it is transmitted through the substrate of arrays 102 or 430 in comparison with the intensity of the evanescent wave generated on the TIR surfaces. This effect reduces the efficiency of the apparatus disclosed by King et al, and necessitates a light source with a high output.

By contrast, since the claimed present application employs a waveguide plate which is a (glass) substrate having samples directly fixed on the surface thereof, a fluorescent substance labeled on samples coupled to probes can be directly fluorescently excited by the evanescent wave generated on the surface of the waveguide plate. Thus, it is not necessary to pay any special consideration to attenuation of the evanescent wave, and a light source with a lower output than the light source of King et al may be used.

In addition, it is also noted that the embodiment of King et al shown in Fig. 6 (cited by the Examiner for the disclosure of a wide TIR surface) disadvantageously requires a fiber laser as a component of the embodiment, which increases the number of parts required in the apparatus. Moreover, when mounting an array with respect to the fiber laser, cumbersome work is required to adhere the fiber laser and the array to each other with a matching oil, for example.

By contrast, according to the present invention as recited in amended independent claim 11, the sampling probes are fixed directly to the waveguide plate, and no equivalent to the fiber laser is required. Thus, the structure of the whole apparatus can be simplified according to the claimed present invention. In addition, with the structure of the claimed present invention, no special consideration is required with respect to the adhesivity of the array to a fiber laser.


In view of the foregoing, it is respectfully submitted that the present invention as recited in amended independent claim 11, as well as claims 12 and 13 depending therefrom, clearly patentably distinguishes over King et al, under 35 USC 102 as well as under 35 USC 103.

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Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,



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